CLAIMS

1. A method of modulating an optical signal comprises the steps of:
providing a waveguide (2) defining a light path for said optical signal;
providing a resonant cavity (5) in said light path; and
altering the transmission characteristic of the resonant cavity (5) whereby to control the degree of transmission of light of a selected frequency propagating in said light path.

2. The modulation method of claim 1, wherein the waveguide-providing step comprises providing a waveguide (2) selected in the group consisting of photonic crystal waveguides, total internal reflection waveguides, and waveguides combining the principles of photonic crystal waveguides and total internal reflection waveguides.

3. The modulation method of claim 1 or 2, wherein the resonant-cavity-providing step comprises providing a plurality of holes defining a photonic bandgap device in the waveguide.

4. The modulation method of claim 1, 2 or 3, wherein the waveguide-providing step comprises providing a waveguide (2) having a silicon (Si) core layer clad with silica (SiO_2).

5. The modulation method of claim 4, wherein the transmission-characteristic-altering step comprises the step of applying an electric field to the resonant cavity (5) whereby to cause the MOS effect and alter the Q-factor of the cavity.

6. The modulation method of claim 1 or 2, and comprising the step of providing a p-n junction in the waveguide at the resonant cavity, wherein the transmission-characteristic-altering step comprises the step of applying a biasing electric field to the p-n junction whereby to alter the Q-factor of the cavity.

7. An optical signal modulator, comprising:
a waveguide (2) defining a light path for an optical signal;
a resonant cavity (5) in said light path; and

a control unit (10) for altering the transmission characteristic of the resonant cavity whereby to control the degree of transmission of light of a selected frequency propagating in said light path.

8. The optical signal modulator of claim 7, wherein the waveguide (2) is selected in the group consisting of photonic crystal waveguides, total internal reflection waveguides, and waveguides combining the principles of photonic crystal waveguides and total internal reflection waveguides.

9. The optical signal modulator of claim 7 or 8, wherein the resonant cavity (5) comprises a plurality of holes defining a photonic bandgap device in the waveguide.

10. The optical signal modulator of claim 7, 8 or 9, wherein the waveguide has a silicon (Si) core layer clad with silica (SiO_2).

11. The optical signal modulator of claim 10, wherein the control unit is adapted, in use, to apply an electric field to the resonant cavity (5) whereby to cause the MOS effect and alter the Q-factor of the cavity.

12. The optical signal modulator of claim 7 or 8, and comprising a p-n junction provided in the waveguide at the resonant cavity, wherein the control means is adapted, in use, to apply a biasing electric field to the p-n junction whereby to alter the Q-factor of the cavity.

13. A planar silicon waveguide defining a light path, the waveguide having a resonant cavity (5) formed in the light path.

14. The planar silicon waveguide of claim 13, wherein the resonant cavity (5) is constituted by a photonic bandgap device.